Kv values

When calculating and dimensioning pipe systems, the following values or formulas for valve resistance must be used. In calculating work, they provide the actual capacity of the valve since the pressure drop is based on measurements (see SMS 1000) at the feed outlet at such a distance from the valve that turbulence inside the valve itself does not influence the values.

Kv values for various pre-settings

Turns \ DN	65	80	100	125	150
0.5	1.8	2	2.5	5.5	6.5
1.0	3.5	4	6	10.5	12
1.5	4.6	6	9	15.5	22
2	6.9	8	11.5	21.5	40
2.5	10.8	11	16	27	65
3	17	14	26	36	100
3.5	25.5	19.5	44	55	135
4	33	29	63	83	169
4.5	43	41	80	114	207
5	52	55	98	141	242
5.5	60.5	68	115	167	279
6	68	80	132	197	312
6.5	73	92	145	220	340
7	77	103	159	249	367
7.5	80.5	113	175	276	391
8	85	120	190	300	420

Note! Graphs on the next page

FORMULAS (For computer use only)

$Kv = A + B\ turns + C\ turns^2 + D\ turns^3 + E\ turns^4 + F\ turns^5$

Coeff. \ DN	65	80	100	125	150
A	– 0.32111	– 0.83694	– 0.65892	– 1.56243	1.23530
B	8.95540	12.39297	17.27869	31.58340	4.35116
C	– 8.70432	– 9.88529	–18.13964	–28.16007	1.11762
D	4.06143	3.51840	8.34584	11.30264	5.25556
E	– 0.59125	– 0.38712	– 1.21898	– 1.49770	– 1.00980
F	0.02783	0.99945	0.05902	0.06713	0.05364

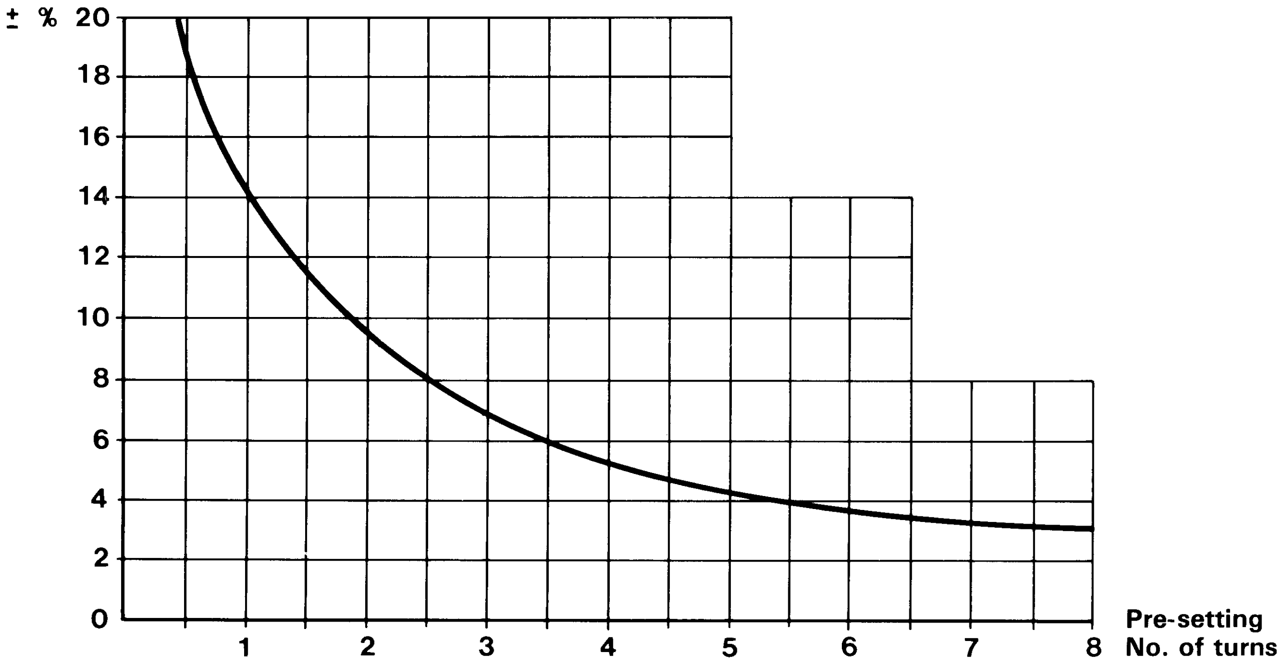
$Kv\ max \cong \frac{d^2}{53}$ d = valve size in mm (65, 80 etc.)

Measuring accuracy

A valve that operates with a high level of flow capacity naturally has a large cross-section area when fully open. TA works with high tolerance demands with respect to valve seat and cone diameters. The level of accuracy is highest when the valve is open. The smaller the opening at which the valve is set, the greater the part played by manufacturing tolerances since the variation in measurement is then considerably more from the viewpoint of percentage.

As a result of extensive measurements carried out in our laboratory, it has been possible to determine the following anticipated maximum deviation in any installation:

Deviation concerning flow with different pre-settings



Correction factors for different liquids

For liquids other than water at +20°C, the pressure drop concerned can be obtained from the TA diagram after correction of ΔP with a factor equal to the weight per unit volume in tons/m³.

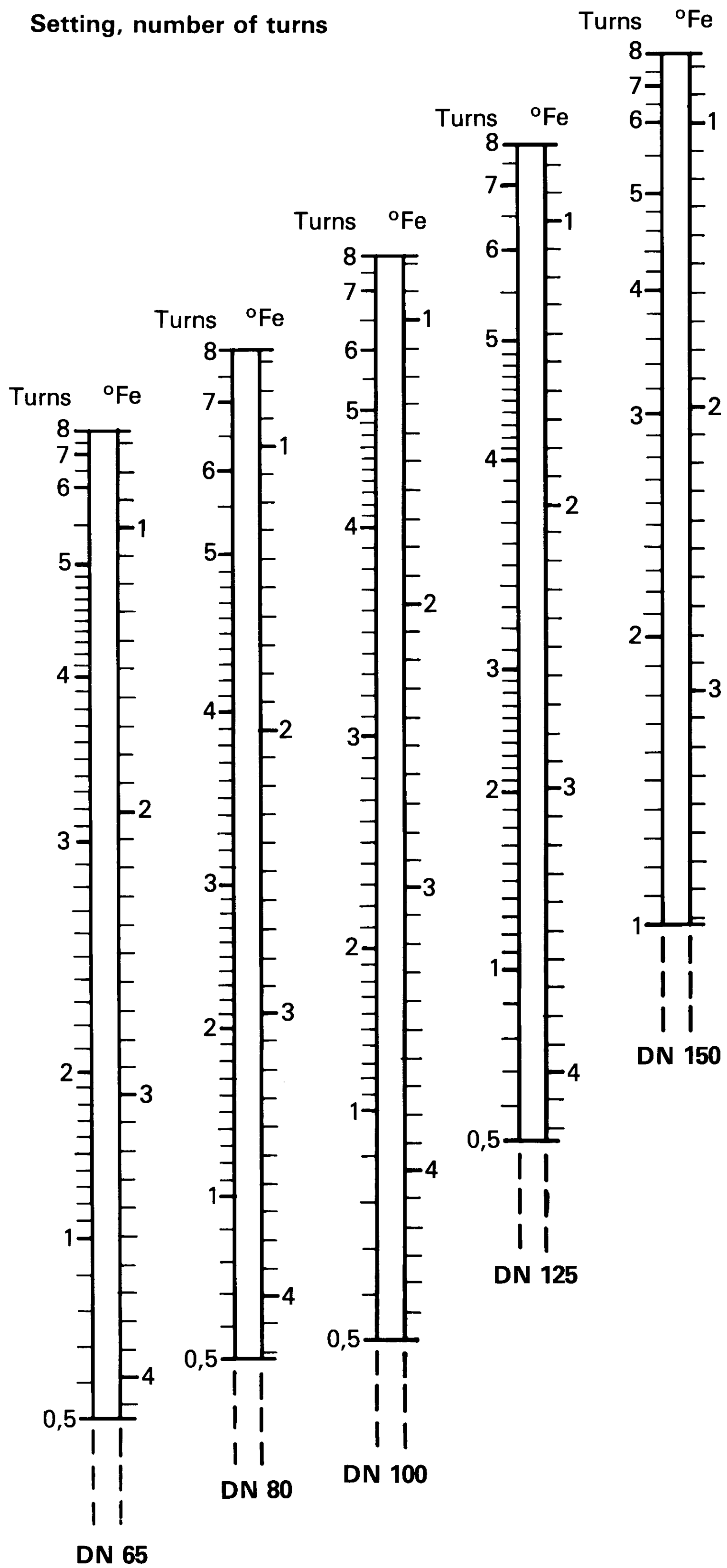
Example

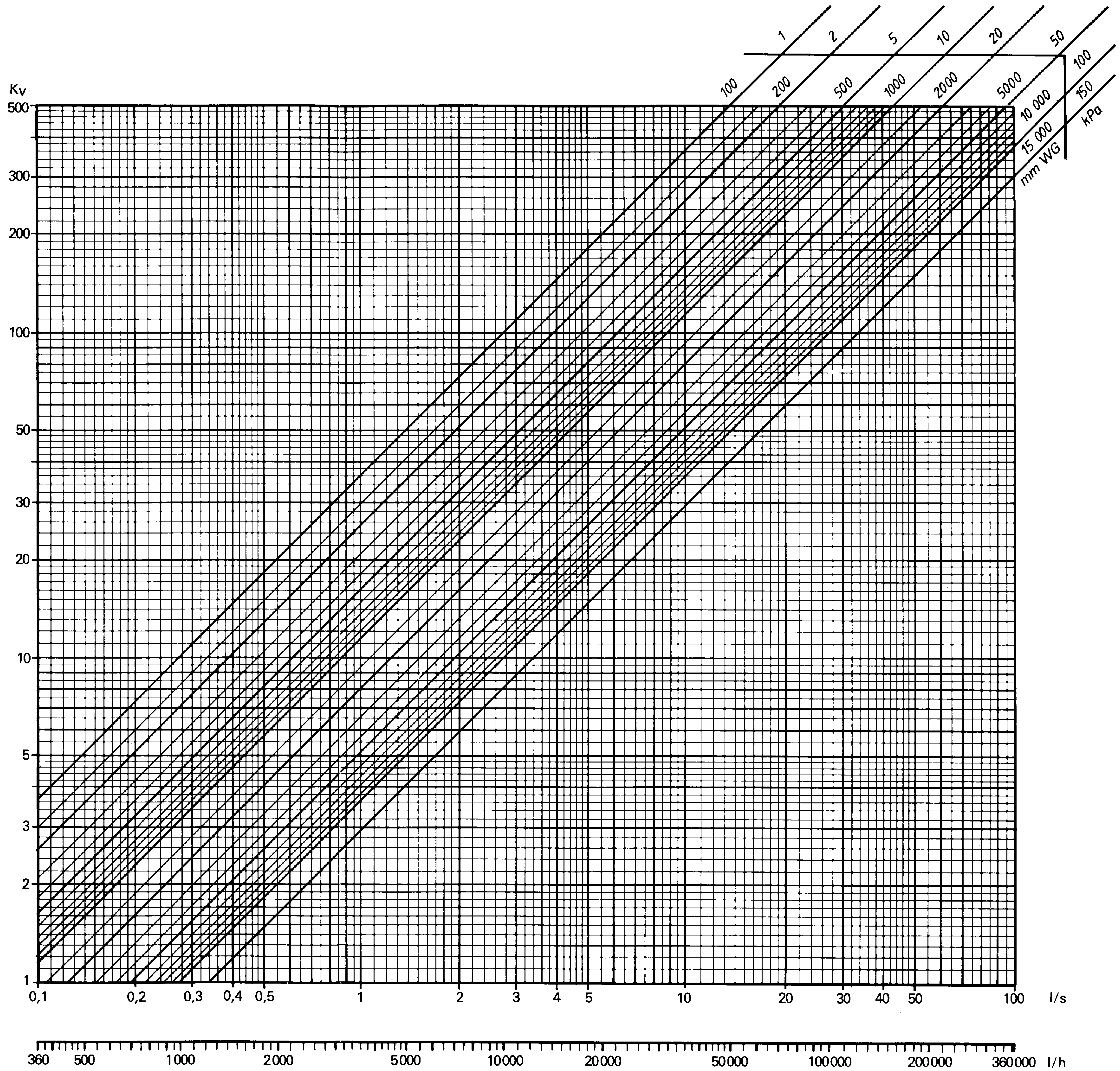
Known flow: Increase the pressure drop read off in the diagram by 10 % if the weight per unit volume is 1.1 tons/m³.

Known pressure drop: Decrease pressure drop by 10 % if weight per unit volume is 1.1 tons/m³, read off the flow in the diagram with this pressure drop.

The above-mentioned applies to liquids that have on the whole the same viscosity ($\leq$ 20 cSt = 3°E = 100 S.U.) as water, that is to say most water/glycol mixtures and water/brine solutions.

This graph shows the pressure drop over the pressure test points of the valve.





°Fe = log. for coefficient ξ d

Kv = Valve coefficient (m³/h at 1 bar)

Kv values

When calculating and dimensioning pipe systems, the following values f
must be used. In calculating work, they provide the actual capacity of tl
pressure drop is based on measurements (see SMS 1000) at the feed outlet
from the valve that turbulence inside the valve itself does not influence th

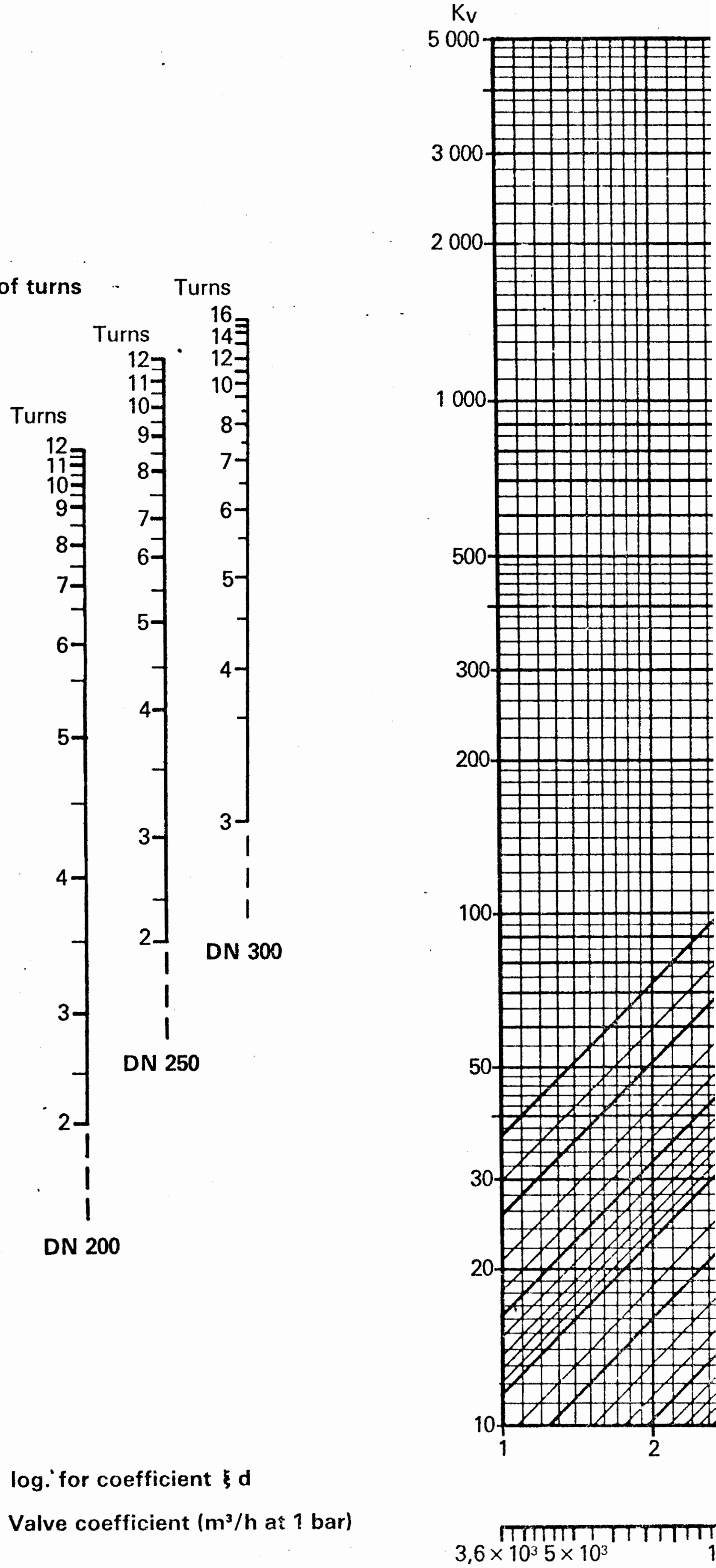
Kv values for various pre-settings

Turns \ DN	200	250
2.0	40	90
2.5	50	110
3.0	65	140
3.5	90	195
4.0	120	255
4.5	165	320
5.0	225	385
5.5	285	445
6.0	340	500
6.5	400	545
7.0	435	590
7.5	470	660
8	515	725
9	595	820
10	650	940
11	710	1050
12	765	1185
13	–	–
14	–	–
15	–	–
16	–	–

PRESSURE DROP DIAGRAM, STA-F DN 200–300

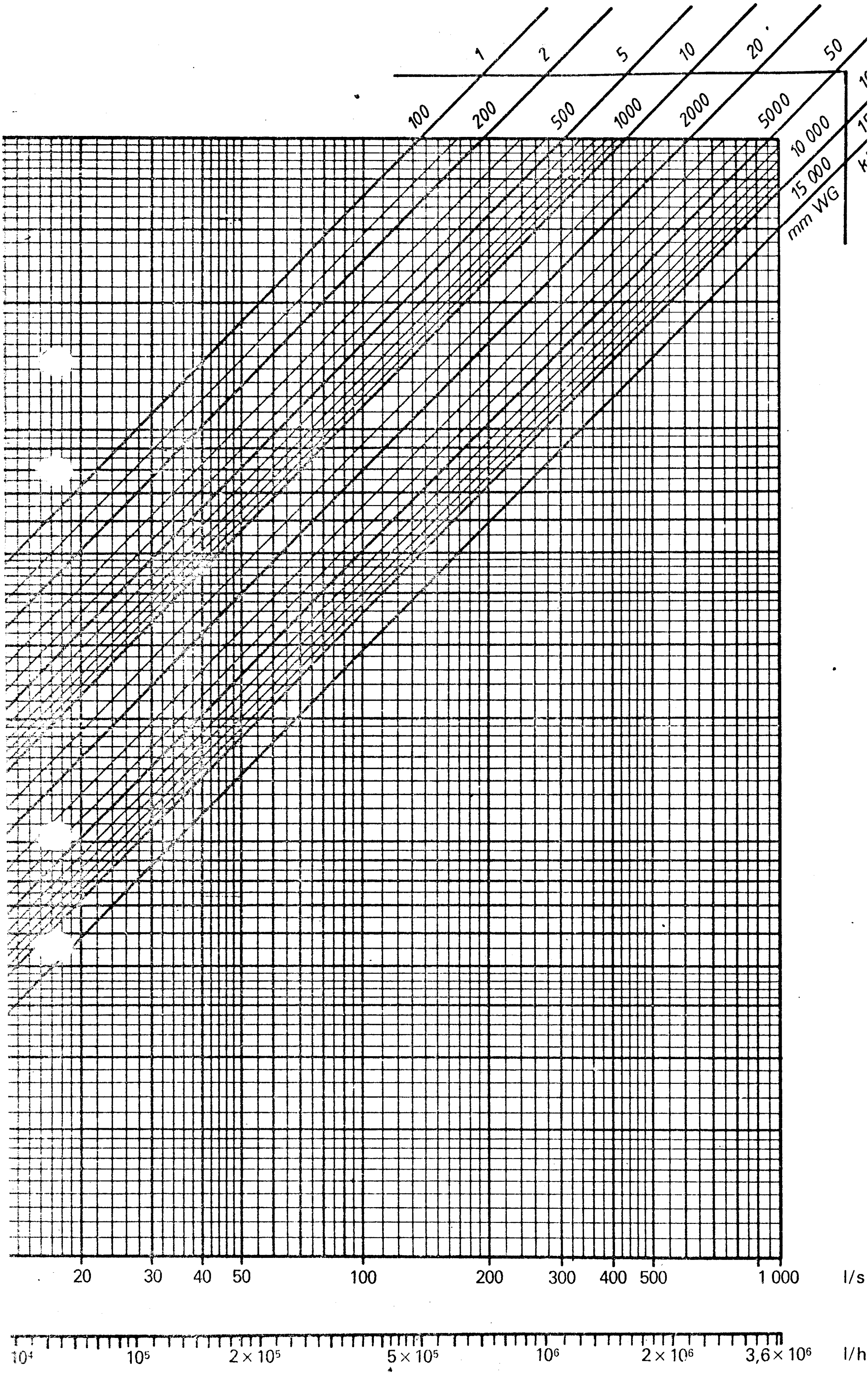
This graph shows the pressure drop over the pressure test points of the valve.

Setting, number of turns



°Fe = log. for coefficient ξ d

K_V = Valve coefficient (m³/h at 1 bar)

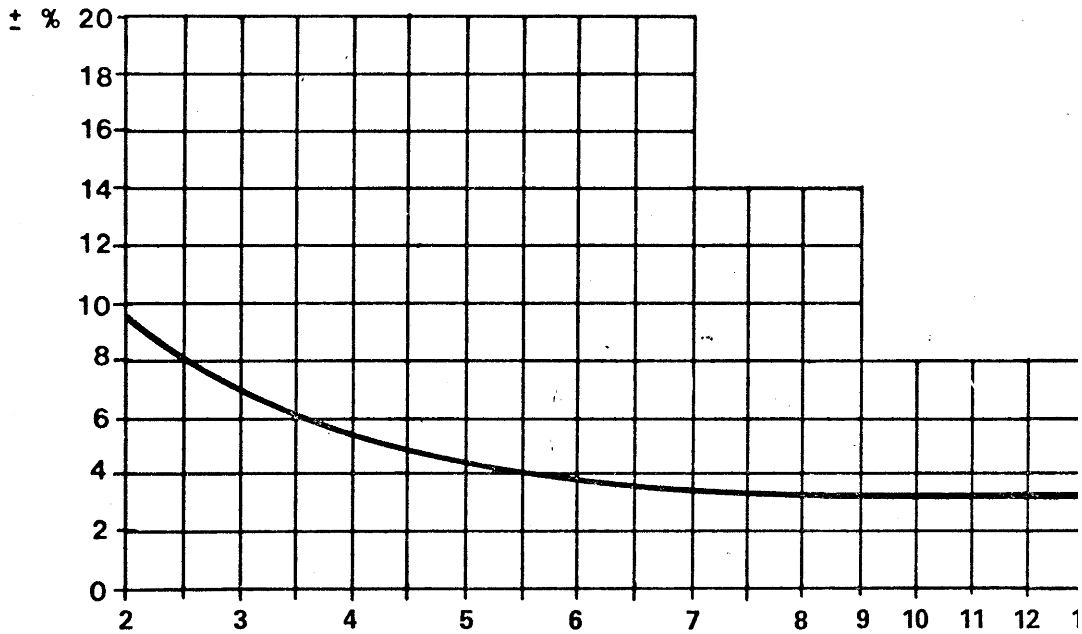

1
2
5
10
20
50
100
200
500
1000
2000
5000
10 000
15 000
mm WG
20
30
40
50
100
200
300
400
500
1 000
l/s
10^4
10^5
2×10^5
5×10^5
10^6
2×10^6
$3,6 \times 10^6$
l/h

Measuring accuracy

A valve that operates with a high level of flow capacity naturally has a large c area when fully open. TA works with high tolerance demands with respect to va cone diameters. The level of accuracy is highest when the valve is open. The opening at which the valve is set, the greater the part played by manufacturin since the variation in measurement is then considerably more from the viewp centage.

As a result of extensive measurements carried out in our laboratory, it has bee determine the following anticipated maximum deviation in any installation:

Deviation concerning flow with different pre-settings



Correction factors for different liquids

For liquids other than water at +20°C, the pressure drop concerned can be ob the TA diagram after correction of ΔP with a factor equal to the weight per ur tons/m³.

Example

Known flow: Increase the pressure drop read off in the diagram by 10 % if the unit volume is 1.1 tons/m³.

Known pressure drop: Decrease pressure drop by 10 % if weight per unit vo tons/m³, read off the flow in the diagram with this pre

The above-mentioned applies to liquids that have on the whole the same visc cSt = 3°E = 100 S.U.) as water, that is to say most water/glycol mixtures and solutions.